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ABSTRACT

Cross-sectional studies have revealed many psychosocial correlates of adolescent substance use, including familial, environmental, and personality variables. In this prospective study, correlates of substance use were classified as concomitants or unstable if they covaried with substance use across time, increasing (or decreasing) when substance use was initiated, and decreasing (or increasing) when the individual quit using the substance. Variables were classified as stable if they did not covary with substance use across time. Variables were further classified as risk factors (predictive of initiation), protective factors (predictive of quitting) and/or consequences of past substance use. Data were collected from adolescents (N=651) aged 11 to 15 and their parents who completed questionnaires in two annual assessments. Parents' attitudes and adolescents perceptions of parents' attitudes were stable characteristics. In contrast, adolescents' attitudes and beliefs were classified as concomitants, changing as substance abuse changed. Parents' rules and adolescents' perceptions of these rules were classified as stable characteristics. (ABL)

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Stable and Unstable Characteristics of Substance Use among Adolescents

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PURPOSE

Cross-sectional studies have revealed many psychosocial correlates of adolescent substance use, including familial, environmental and personality variables. A prospective study is necessary to clarify the nature of the influence of these variables on substance use and to distinguish stable predisposing characteristics from concommitants and consequences of substance use.

In this prospective study, correlates of substance use are classified as concomitants or unstable if they covaried with substance use across time, increasing (or decreasing) when substance use was initiated, and decreasing (or increasing) when the individual quit using the substance. Variables are classified as stable if they did not covary with substance use across time. Variables are further classified as risk factors (predictive of initiation), protective factors (predictive of quitting) and/or consequences of past substance use.

With concomitants, causation is hypothesized to be reciprocal, both a cause and a consequence of substance use. Thus the causal role of concomitants in the etiology of substance use is difficult to establish. In contrast, characteristics which are stable can be more clearly defined as risk or protective factors and/or consequences.

Classification of variables as concomitants or stable factors, is essential for several reasons. First, it is central to the development and refinement of models describing the etiology of substance use. Second, the focus of researchers and clinicians on the more promising etiological variables (e.g. stable risk or protective factors) may be more fruitful than on variables that appear to be concomitants or consequences of substance use.

METHOD

Data from 651 eleven to fifteen year-old adolescents (mean age = 13.2 years) and their parents who completed questionnaires in two annual assessments (T1 and T2). 51.5% of the adolescents were female; 48.5% were male. 55.5% of the teens were from two-parent families; 44.5% lived with mother only and 3.5% lived with father only.

Adolescents and their parent(s) completed parallel instruments assessing parental attitudes toward substance use, encouragement of use, admonitions against use, and rules and criticisms regarding use, family cohesion and quality of the teen/parent relationship, and the occurrence of stressful events in the teen's life. Parents completed instruments assessing their use and teens completed instruments assessing their use and their personality characteristics. Variables measures are give in Table 1.

Classification Rules

Variables were classified as concommitants or stable characteristics, and as risk factors, protective factors and/or consequences using the following rules. Only variables which were correlated ($r > .15$) with substance use at either T1 or T2 were eligible for further classification.

Concommitants: Variables were classified as concommitants or unstable if they covaried across time with substance use. For this determination, only groups that changed their substance use (groups 3 and 4) (See: Table 2) were used. The significance of the Group by Time interaction effect of a repeated measures ANOVA was examined for each variable and for each substance. If the interaction effect was significant ($p < .05$) and means were in the expected direction, the variable was

classified as a concomitant if initiation or quitting the use of that substance.

Stable Factors: Variables that were not classified as concomitants were considered stable characteristics.

Risk Factors: Variables were classified as risk factors if they were predictive of the initiation of the use of a substance and therefore discriminated between those adolescents who remained non-users at T2 (Group 1) and those adolescents who started using a substance between T1 and T2 (Group 4). The significance of the between group effect in an ANOVA was examined for each variable measured at T1. If the effect was significant ($p < .05$), the variable was classified as a risk factor.

Protective Factors: Variables were classified as protective factors if they were predictive of quitting the use of a substance and therefore discriminated between those adolescents who remained users (Group 2) and those adolescents who quit using a substance between T1 and T2 (Group 3). The significance of the between group effect in an ANOVA was examined for each variable measured at T1. If the effect was significant ($p < .05$), the variable was classified as a protective factor.

Consequences: Variables were classified as consequences of past substance use if the variable, measured at T2, discriminated between those adolescents who were non-users at both T1 and T2 (Group 1)and those adolescents who were users at T1 but quit using between T1 and T2 (Group 3). The significance of the between group effect in an ANOVA was examined for each variable measured at T2. If the effect was significant ($p < .05$), the variable was classified as a consequence of the use of that substance.

SUMMARY OF RESULTS

The classification of each of the correlates is given in Table 3. Highlights of these results are given below.

Use by Family Members

Father's marijuana use appears to be a stable predisposing characteristic; those adolescents who initiated use between T1 and T2 were more likely to have fathers that smoke marijuana.

Attitude toward Use

Parents' attitude and adolescent's perceptions of parents' attitudes were stable characteristics. The results suggest that adolescents were less likely to initiate marijuana use and more likely to quit using if mothers had a negative attitude toward marijuana use and/or adolescents perceived them as having a negative attitude toward use.

In contrast, adolescent's attitudes and beliefs, with a few exceptions, were classified as concomitants, changing as substance use changed. Adolescent's perception of peer attitude were also predominately concomitants. This latter finding has several possible explanations: Adolescents may change their peer group as a function of their substance use; Change in both adolescent's use and peer attitude may be due to change in peer use; or only the adolescent's perception of peer attitude may change with use, and not the actual attitude of the peer.

Encouragement of Use

Parents' encouragement and adolescent's perception of encouragement were primarily stable characteristics. Adolescents who perceived their mothers as not encouraging them to use alcohol and/or cigarettes were more likely to quit

smoking than were adolescents who perceived their mothers as encouraging their use. Adolescents who perceived their mothers as encouraging them to use marijuana were more likely to initiate marijuana use; and adolescents who had fathers who encouraged their use of cigarettes were more likely to use marijuana.

Rules against Use

Parent rules and adolescent's perceptions of these rules were classified as stable characteristics. Rules were often risk and protective factors, but, with the exception of consequences, were not in the direction one might suspect. Adolescents who initiated the use of a substance between T1 and T2 had more rules against use than did those who remained non-users. Similarly, adolescents who quit using had fewer rules against use. Not surprising, however, adolescents who had used a substance prior to the last year, had more rules against use than did those who had never used the substance.

Admonitions against Use

Parents' admonitions against use and adolescent's perceptions of admonitions were correlated only with cigarette and marijuana use. Although all were stable characteristics, few were also risk or protective factors. Adolescents who had mothers who admonished them against cigarette use were more likely to quit smoking marijuana; and adolescents who perceived their father as admonishing them against cigarette use were less likely to start smoking. Admonitions and adolescent's perceptions of admonitions were consequences of cigarette use.

Personality Variables

The results suggested that the personality characteristics from the Jessors' Problem Behavior Theory (Jessor, 1987) are concomitants of cigarette

and marijuana use and stable characteristics of alcohol use. The exception is the discrepancy between value of achievement and value of independence as a stable risk factor for marijuana use. Adolescents who value independence more than achievement are more likely to start using marijuana. The propensity to take risks was also a stable risk factor for both alcohol and marijuana use; a high propensity to take risks predisposed individuals to initiate both alcohol and marijuana use.

Family/Peer Relationships

Parental support, adolescent's perception of their relationship with mother and father's perception of relationship with adolescent were stable characteristics of cigarette use. Father's perception of the relationship was also a risk factor; adolescents with poor relationships with their father were more likely to start using cigarettes.

CONCLUSIONS

1. The focus of researchers and clinicians interested in the etiology of adolescent substance use should be on parents' attitudes, encouragement, admonitions and rules, rather than on adolescent's attitude or the personality variables of the adolescent.

2. The results regarding parents' rules and criticisms were unexpected. Adolescents who initiated the use of a substance between T1 and T2 and who continued using a substance had more rules than did those who remained non-users or who quit using.

3. Prior analyses with this data set (Andrews, et al., submitted) have indicated that substance use forms a sequential Guttman pattern in which alcohol use precedes cigarette use, which precedes marijuana use. The

consequences of use of one substance may be a risk factor for using the next substance in the sequence. This pattern is evident in the results regarding the adolescent's perception of mother's rules against use. This data indicates that mother's rules increase as a consequence of cigarette use and are also a risk factor for marijuana use.

4. In the Jessors' Problem Behavior Theory, personality characteristics are viewed as stable. The results from this study suggested that they are concomitants of cigarette and marijuana use. Replication and perhaps refinement of the model is needed.

Table 1. Variables measured in study.

Adolescent Substance Use

-- Adolescent's self-reported use of tobacco, alcohol, and marijuana; coded as dummy variables using two categories: use versus non-use.

Substance Use of Parents

-- Parents' self-reported use of tobacco, alcohol, and marijuana.

Parent, Peer and Adolescent Attitude toward Use

-- Parents' self-report of negative attitude toward adolescent substance use (of tobacco, alcohol, and marijuana).
-- Adolescent's perception of parent attitude toward the adolescent's use.
-- Adolescent's perception of peer attitude toward the adolescent's use.
-- Adolescent's self-reported general attitude toward use.
-- Adolescent's beliefs regarding use of each substance.

Parent Encouragement of Adolescent's Use

-- Parents' self-report of encouragement to use each substance (e.g. I have smoked cigarettes (drunk alcohol, used marijuana) with my son/daughter).
-- Adolescent's perception of parents' encouragement to use each substance.

Parent Rules Regarding Adolescent's Use

-- Parents' self-report of rules, criticisms, or punishments regarding use (e.g. I have told my son/daughter not to smoke cigarettes (drink alcohol, use marijuana) at home.)
-- Adolescent's perceptions of parents' rules regarding use of each substance.

Parent's Admonitions Against Substance Use

-- Parents' self-report of admonitions against the use of each substance (e.g. I have warned my son/daughter about the health consequences of smoking cigarettes (drinking alcohol, smoking marijuana).)
-- Adolescent's perceptions of parents' admonitions against use.

Personality Variables (self-report of adolescent)

-- Variables incorporated in Problem-Behavior Theory (Jessor & Jessor):
    -- Value on academic achievement
    -- Value on independence
    -- Independence-achievement value discrepancy
    -- Attitudinal tolerance of deviance
    -- Religiosity
    -- General deviant behavior

Table 1, continued

- Other personality variables:
  - Self esteem
  - Propensity to take risks
  - Social skills

Environmental Events

- Adolescent's self-report regarding the occurrence of stressful events.
- Parents' perception of the occurrence of stressful events to the adolescent.

Family/Peer Relationships

- Variables incorporated in Problem Behavior Theory (self-report of adolescent):
  - Parental support
  - Friends support
  - Parental control
  - Friends control
  - Parent-Friends Compatibility
  - Parent-Friends Influence
- Other Family Relationship Variables:
  - Parents' perception of family cohesion
  - Adolescent's perception of family cohesion
  - Adolescent's perception of quality of the relationship with both mother and father
  - Parent's perception of the quality of the relationship with their teen

Table 2. Groupings of subjects according to their T1 and T2 substance use.

(1) Non-users at T1, non-users at T2
(2) Users at T1, users at T2
(3) Users at T1, non-users at T2
(4) Non-users at T1, users at T2

Group	Sample Size for Each Substance		
	Alcohol	Cigarettes	Marijuana
(1) Non-Use/Non-Use	248	455	435
(2) Use/Use	240	100	114
(3) Use/Non-Use	57	34	33
(4) Non-Use/Use	106	62	69

Table 3 Stable and Unstable Characteristics of Substance Use Among Adolescents

Construct/Variable	Classification: Alcohol Use S/C	R	P	C	Cigarette Use S/C	R	P	C	Marijuana Use S/C	R	P	C
Use by Family Members												
Dad's marijuana use	-	-	-	-	-	-	-	-	S	Y	N	N
Attitude Toward Use												
Adolescent's attitude toward:												
alcohol use	S	N	Y	Y	C	N	N	N	C	Y	N	N
cigarette use	C	N	N	Y	C	N	Y	N	C	Y	N	N
marijuana use	S	N	Y	N	C	Y	N	N	C	Y	Y	N
Adolescent's beliefs regarding:												
alcohol use	C	Y	Y	Y	C	Y	N	Y	C	Y	N	Y
cigarette use	-	-	-	-	S	N	N	Y	S	N	N	Y
marijuana use	C	Y	Y	Y	C	Y	N	Y	C	Y	Y	N
Adolescent's perception of peer attitude toward:												
alcohol use	C	N	Y	Y	C	Y	N	N	C	Y	N	Y
cigarette use	-	-	-	-	C	N	N	N	S	Y	N	N
marijuana use	S	N	Y	Y	C	Y	N	Y	C	Y	N	Y
Mother's negative attitude toward:												
cigarette use	-	-	-	-	S	N	N	N	-	-	-	-
marijuana use	-	-	-	-	S	N	N	N	S	Y	Y	N
Adolescent's perception of mother's negative attitude toward:												
cigarette use	-	-	-	-	S	N	Y	Y	-	-	-	-
marijuana use	-	-	-	-	S	N	Y	Y	S	Y	Y	N

father's negative attitude toward:			
cigarette use	- - - -	S N N Y	- - - -
marijuana use	- - - -	- - - -	S Y N N
Adolescent's perception of father's negative attitude toward:			
marijuana use	- - - -	S N N N	- - - -
Parent Encouragement of Use			
Mother's encouragement of:			
cigarette use	- - - -	S N Y N	S N N N
marijuana use	- - - -	S N N N	S Y Y Y
Adolescent's perception of mother's encouragement of:			
alcohol use	C Y Y Y	S N Y Y	- - - -
cigarette use	S N N N	S N Y Y	S N N Y
marijuana use	- - - -	S N N Y	S Y N Y
Father's encouragement of:			
cigarette use	- - - -	S N N Y	S Y N Y
marijuana use	- - - -	S N N Y	- - - -
Adolescent's perception of father's encouragement of:			
alcohol use	- - - -	S N N Y	S N N Y
cigarette use	- - - -	S N N Y	- - - -
marijuana use	- - - -	- - - -	S Y N Y

Parent Rules			
Mother's rules against:			
alcohol use	- - - -	S Y Y N	S Y N Y
cigarette use	- - - -	C Y Y Y	S N N Y
marijuana use	- - - -	S N N Y	S N Y Y
Adolescent's perception of mother's rules against:			
alcohol use	- - - -	S N N Y	S Y N Y
cigarette use	- - - -	S N N Y	S Y N Y
marijuana use	- - - -	S N N Y	S Y N Y
Father's rules against:			
alcohol use	- - - -	S Y Y N	S N N Y
cigarette use	- - - -	C N Y N	S N N Y
marijuana use	- - - -	S Y N N	S N Y Y
Adolescent's perception of father's rules against:			
alcohol use	- - - -	S N N N	- - - -
cigarette use	- - - -	S N N Y	- - - -
marijuana use	- - - -	S N N N	S N N Y
Parent Admonitions			
Mother's admonitions against:			
cigarette use	- - - -	S N N Y	S N Y N
Adolescent's perception of mother's admonitions against:			
cigarette use	- - - -	S N N N	- - - -

Father's admonitions against:			
cigarette use	- - - -	S N N Y	- - - -
marijuana use	- - - -	S N N N	- - - -
Adolescent's perception of father's admonitions against:			
cigarette use	- - - -	S Y N Y	- - - -
Personality Variables			
Value on Academic Achievement	S N N Y	C N Y N	S Y N N
Discrepancy between Achievement and Independence	S N Y Y	C Y Y N	C Y N Y
Attitudinal Tolerance of Deviance	S Y N Y	C Y Y N	C Y N Y
General Deviant Behavior	S N N Y	C Y N Y	C Y N Y
Self Esteem	- - - -	S N N N	- - - -
Propensity to Take Risks	S Y N Y	C Y N Y	S Y N Y
Environmental Events			
Mother's perception of stressful events	- - - -	S N N N	- - - -

Family/Peer Relationships										
Parental support	-	-	-	-	S	N	N	Y	-	-	-	-
Parent/Friend compatibility	-	-	-	-	C	Y	N	N	-	-	-	-
Adolescent's perception of:										
Family Cohesion	-	-	-	-	C	N	N	N	-	-	-	-
Relationship with mother	-	-	-	-	S	N	N	Y	-	-	-	-
Relationship with father	-	-	-	-	S	N	N	N	-	-	-	-
Father's perception of relationship with adolescent	-	-	-	-	S	Y	N	N	-	-	-	-

Note. Only variables that are correlated ($r > .15$ at T1 or T2) with use of any substance are included in this table. Variables not correlated with use of that substance are indicated with a dotted line.

S/C = Stable/Concommitant classification
R = Risk Factor
P = Protective Factor
C = Consequences

Y = Yes
N = No

References

Andrews, J., Hops, H., Ary, D., Lichtenstein, E., & Tildesley, E. (1989). The construction, validation, and use of a Guttman scale of adolescent substance use: An investigation of family influence. Submitted for publication.

Jessor, R. (1987). Problem-Behavior Theory, Psychosocial Development, and Adolescent Problem Drinking, British Journal of Addiction, 82, 331-342.